

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants : Assaf Govari Confirmation No.: 1108
Appln. No. : 10/632,217
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Title : DETECTION OF METAL DISTURBANCE IN A MAGNETIC
TRACKING SYSTEM

Art Unit : 2862
Examiner : David M. Schindler

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APPEAL BRIEF

i. Real Party in Interest

Biosense Webster, Inc., a California Corporation, is the real party in interest.

ii. Related Appeals and Interferences

None.

iii. Status of Claims

Claims 1-22 are pending in the case. Claims 1-22 have been finally rejected on October 19, 2006 and this Appeal is taken from these claims.

iv. Status of Amendments

No Amendments have been filed subsequent to the Final Rejection mailed on October 19, 2006.

v. Summary of Claimed Subject Matter

As fully supported in Applicant's Specification, particularly Page 13, Line 16 – Page 15, Line 18 and Fig. 2, the claimed present invention of independent claim 1 is directed to a method for tracking an object (probe 20 as shown in Fig. 1), comprising (i) producing energy fields at a plurality of different frequencies (step 50 of Fig. 2) in a vicinity of the object 20; (ii) receiving signals that are generated at a location of the object 20 at the different frequencies in response to the energy fields; (iii) making multiple computations of spatial coordinates of the object based on the signals received at the different frequencies (step 52 of Fig. 2); ascertaining whether the energy fields have been perturbed by an article in the vicinity of the object (step 60) by testing a convergence (step 54) of the computations; and (iv) if testing reveals a convergence of the computations (step 54 and 56), then repeating steps (i) through (iv) for N repetitions, wherein N equals a plurality of times. Specification Page 13, Line 16 – Page 15, Line 18 and Fig. 2.

As fully supported in Applicant's Specification, for example, Page 8, Line 1 – Page 13, Line 15 (for the elements) and Page 13, Line 16 – Page 15, Line 18 and Fig. 2 (for their functionality), independent Claim 12 is directed to an apparatus 10 for tracking an object (probe 20) comprising at least one radiator 22, 24, 26 which is adapted to produce energy fields at a plurality of different frequencies in a vicinity of the object 20; at least one sensor 27, 28, 29, fixed to the object 20, which is adapted to generate signals in response to the energy fields at the different frequencies; and a system controller 36, which is adapted to (i) make multiple computations of spatial coordinates of the object 20 based on the signals generated at the different frequencies, and to (ii) ascertain whether the energy fields have been perturbed by an article in the vicinity of the object by testing a convergence of the computations, wherein the system controller repeats (i) and (ii) when testing reveals a convergence of the computations for N repetitions, wherein N equals a plurality of times.

vi. Grounds of Rejection to be Reviewed on Appeal

1. Claims 1 – 22 stand finally rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 6,073,043 (Schneider).

vii. Argument

1. The rejection of Claims 1 – 22 under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. (Schneider) is improper and without basis and should be overruled.

In reaching the above-outlined rejection, the Examiner relies on very vague teachings mentioned in Schneider in conjunction with extraneous material such as a definition of “iterative method” from Wikipedia (not known to be based on any scientific or accepted facts). Upon careful scrutiny of each of these teachings in Schneider, it is clear that none of these modest teachings teach or suggest the novel combination of method steps and elements for tracking an object comprising producing energy fields at a plurality of different frequencies in a vicinity of the object (through use of at least one radiator as set forth in the apparatus claim of Claim 12) and receiving signals that are generated at a location of the object at the different frequencies in response to the energy field and making multiple computations of spatial coordinates of the object based on the signals received at the different frequencies in conjunction with ascertaining whether the energy fields have been perturbed by an article in the vicinity of the object by testing a convergence of the computations and if testing reveals a convergence of the computation, then repeating these steps for N repetitions, where N equals a plurality of times (through use of a system controller as set forth in Claim 12).

It is well-established precedent that a reference must enable someone to practice the invention in order to anticipate under 35 USC §102(b). *Symbol Technologies v. Opticon Inc.*, 935 F.2d 1569, 19 USPQ 2d 1241, 1247 (Fed. Cir. 1991). Thus, based on the very general and vague teachings in Schneider, it is clear that this reference could never teach someone of ordinary skill in this field to make and use the key elements/steps of

Applicant's claimed present invention, particularly, a method and apparatus for tracking an object comprising producing energy fields at a plurality of different frequencies in a vicinity of the object (through use of at least one radiator as set forth in Claim 12) and receiving signals that are generated at a location of the object at the different frequencies in response to the energy field and making multiple computations of spatial coordinates of the object based on the signals received at the different frequencies in conjunction with ascertaining whether the energy fields have been perturbed by an article in the vicinity of the object by testing a convergence of the computations and if testing reveals a convergence of the computation, then repeating these steps for N repetitions, where N equals a plurality of times.

Furthermore, it is also well established that rejections under 35 USC §102 are proper only when the claimed subject matter is identically disclosed or described in the prior art. *In re Arkley*, 59 CCPA 804, 455 F. 2d 586, 587, 172 USPQ 524, 526 (1972). Thus, in order to constitute an anticipation, all material elements recited in a claim must be found in one unit of prior art. *Soundsciber Corp. v. United States*, 360 F.2d 954,960, 148 USPQ 298, 301 (Ct. Cl. 1966).

And, upon careful review of Schneider, it is evident that this reference fails to identically disclose or describe the key elements/steps of Applicant's claimed present invention such as a method and apparatus for tracking an object (Claim 1 and Claim 12 respectively) comprising producing energy fields at a plurality of different frequencies in a vicinity of the object (through use of at least one radiator as set forth in Claim 12) and receiving signals that are generated at a location of the object at the different frequencies in response to the energy field and making multiple computations of spatial coordinates of the object based on the signals received at the different frequencies in conjunction with ascertaining whether the energy fields have been perturbed by an article in the vicinity of the object by testing a convergence of the computations and if testing reveals a convergence of the computation, then repeating these steps for N repetitions, where N equals a plurality of times (through use of a system controller as set forth in Claim 12). Accordingly, Applicant's claimed present invention is simply not anticipated by this reference.

Additionally, the PTO has the burden under section 103 of establishing a *prima facie* case of obviousness. This burden can only be satisfied by showing some objective teaching in the prior art or that knowledge generally available in the art would lead one of ordinary skill in the art to combine the relevant teachings of the reference. See *In re Fine*, 5 U.S.P.Q. 2d 1596, 1598 (Fed. Cir. 1988). Thus, based on the vague teachings set forth in Schneider, there is no suggestion or teaching in this reference that would ever lead to Applicant's claimed present invention as outlined above.

Moreover, as set forth in *In re Gurley*, 27 F.3d 551; 31 USPQ 2d 1130 (Fed. Cir. 1994):

A reference may be said to teach away when a person of ordinary skill, upon reading the reference, would be discouraged from following the path set out in the reference, or would be in a direction divergent from the path that was taken by Applicant.

As mentioned above, the Schneider reference is entirely vague and completely silent on key steps and elements distinctly claimed by Applicant's claimed present invention of Claims 1 and 12 respectively. Particularly, tracking an object comprising producing energy fields at a plurality of different frequencies in a vicinity of the object (through use of at least one radiator as set forth in Claim 12) and receiving signals that are generated at a location of the object at the different frequencies in response to the energy field and making multiple computations of spatial coordinates of the object based on the signals received at the different *frequencies in conjunction with ascertaining whether the energy fields have been perturbed by an article in the vicinity of the object by testing a convergence of the computations and if testing reveals a convergence of the computation, then repeating these steps for N repetitions, where N equals a plurality of times*. Thus, one of ordinary skill in the surgical navigation field would be entirely discouraged from following the path set out in the teachings of Schneider. Accordingly, it is clear that this reference actually teaches away from Applicant's claimed present invention.

Serial No. 10/632,217

Therefore, based on the reasons outlined above, it is clear that this anticipation rejection is without merit and should be overruled.

Respectfully submitted,

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viii. Claims Appendix

Claim 1. A method for tracking an object, comprising:

- (i) producing energy fields at a plurality of different frequencies in a vicinity of the object;
- (ii) receiving signals that are generated at a location of the object at the different frequencies in response to the energy fields;
- (iii) making multiple computations of spatial coordinates of the object based on the signals received at the different frequencies; ascertaining whether the energy fields have been perturbed by an article in the vicinity of the object by testing a convergence of the computations; and
- (iv) if testing reveals a convergence of the computations, then repeating steps (i) through (iv) for N repetitions, wherein N equals a plurality of times.

Claim 2. The method according to claim 1, wherein producing the energy fields comprises producing magnetic fields, and wherein receiving the signals comprises receiving electrical signals which are generated responsively to the magnetic fields.

Claim 3. The method according to claim 2, wherein producing the magnetic fields comprises driving multiple radiator coils with electrical currents at the different frequencies so as to generate the magnetic fields.

Claim 4. The method according to claim 3, wherein driving the multiple radiator coils comprises driving each of the coils to generate the magnetic fields at a unique, respective set of the frequencies.

Claim 5. The method according to claim 3, wherein receiving the electrical signals comprises receiving the electrical signals from one or more sensor coils that are fixed to the object.

Claim 6. The method according to claim 1, wherein producing the energy fields comprises scanning sequentially through a predetermined sequence of the frequencies.

Claim 7. The method according to claim 1, wherein producing the energy fields comprises generating the fields simultaneously at the different frequencies.

Claim 8. The method according to claim 1, wherein making the multiple computations comprises solving a set of simultaneous equations relating the received signals to the spatial coordinates of the object.

Claim 9. The method according to claim 1, wherein making the multiple computations comprises applying an iterative method of approximation to determine the spatial coordinates, and wherein testing the convergence comprises evaluating a convergence criterion of the iterative method.

Claim 10. The method according to claim 1, wherein testing the convergence comprises detecting a discrepancy between the spatial coordinates computed at the different frequencies.

Claim 11. The method according to claim 1, and comprising, upon ascertaining that the energy fields have been perturbed, correcting the computations to compensate for a presence of the article in the vicinity of the object.

Claim 12. Apparatus for tracking an object, comprising:

- at least one radiator, which is adapted to produce energy fields at a plurality of different frequencies in a vicinity of the object;

- at least one sensor, fixed to the object, which is adapted to generate signals in response to the energy fields at the different frequencies; and

- a system controller, which is adapted to: (i) make multiple computations of spatial coordinates of the object based on the signals generated at the different frequencies, and to (ii) ascertain whether the energy fields have been perturbed by an article in the vicinity of the object by testing a convergence of the computations, wherein the system controller repeats (i) and (ii) when testing reveals a convergence of the computations for N repetitions, wherein N equals a plurality of times.

Claim 13. The apparatus according to claim 12, wherein the energy fields comprise magnetic fields, and wherein the signals comprise electrical signals which are generated by the at least one sensor responsively to the magnetic fields.

Claim 14. The apparatus according to claim 13, wherein the at least one radiator comprises multiple radiator coils and driving circuitry, which is adapted to drive the radiator coils with electrical currents at the different frequencies so as to generate the magnetic fields.

Claim 15. The apparatus according to claim 14, wherein the driving circuitry is adapted to drive each of the coils to generate the magnetic fields at a unique, respective sequence of the frequencies.

Claim 16. The apparatus according to claim 14, wherein the at least one sensor comprises one or more sensor coils.

Claim 17. The apparatus according to claim 12, wherein the at least one radiator is adapted to generate the energy fields sequentially with a predetermined sequence of the frequencies.

Claim 18. The apparatus according to claim 12, wherein the at least one radiator is adapted to generate the fields simultaneously at the different frequencies.

Claim 19. The apparatus according to claim 12, wherein the system controller is adapted to compute the spatial coordinates by solving a set of simultaneous equations relating the signals to the spatial coordinates of the object.

Claim 20. The apparatus according to claim 12, wherein the system controller is adapted to compute the spatial coordinates by applying an iterative method of approximation, and to test the convergence of the computations by evaluating a convergence criterion of the iterative method.

Claim 21. The apparatus according to claim 12, wherein the system controller is adapted

to test the convergence by detecting a discrepancy between the spatial coordinates computed at the different frequencies.

Claim 22. The apparatus according to claim 12, wherein the system controller is adapted, upon ascertaining that the energy fields have been perturbed, to correct the computations to compensate for a presence of the article in the vicinity of the object.

ix. Evidence Appendix

Not Applicable.

x. Related Proceedings Appendix

Not Applicable.